VIRTUAL REALITY BASED ON HUMAN COMPUTER INTERACTION

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ABSTRACT: The main aim of this system is to implementing Virtual Touch Buttons and sliders with camera using a laptop /pc. We propose a large interactive display with Virtual touch buttons on a pale-colored flat wall. Our easy- to-install system consists of a front projector and a single commodity camera. A button touch is detected based on the area of the shadow cast by the user's hand. Background subtraction is used to extract the foreground region. The reference image for the background is continuously adjusted to match the ambient light. The Virtual sliders are based on this touch-button mechanism. When tested, our scheme proved robust to difference in illumination.

KEYWORDS: Virtual reality system and sliders

1 INTRODUCTION

As consumer-grade digital projectors and cameras have become less expensive, many interactive projector-camera systems have been proposed. In particular, since ordinary flat walls can be used as the screen, large interactive displays can be used for digital signage and information boards in public spaces without the need for expensive touch panels. Our aim is to make large, easy-to-install, economical interactive displays; therefore, we use a front projector and a nearby camera. A hand touch on the screen is detected by the area of the shadow cast by the user's hand. The key idea is that the shadow color does not depend on the projected color. The issue is when and how to alter the button color to capitalize on this idea without sacrificing usability.

2 SYSTEM ARCHITECTURE

The system consists of two module-Transmitter and Receiver module. The transmitting module holds Virtual touch screen, Virtual Reality sensing system and Wireless Transmitter. The Receiver module holds Wireless Receiver, Arduino Ic and Pc. The PC which is attached to this setup will contains mouse control software which shows the control of our mouse action.

The sensing system can be detected by Track software. The result of sensing will be shown in the PC where our receiver is connected. The figure shows that the general block diagram of Virtual Reality based on Human computer Interaction. Arduino can be act as the centralized unit, because it performs all essential operations.

2.1   TRANSMITTER MODULE
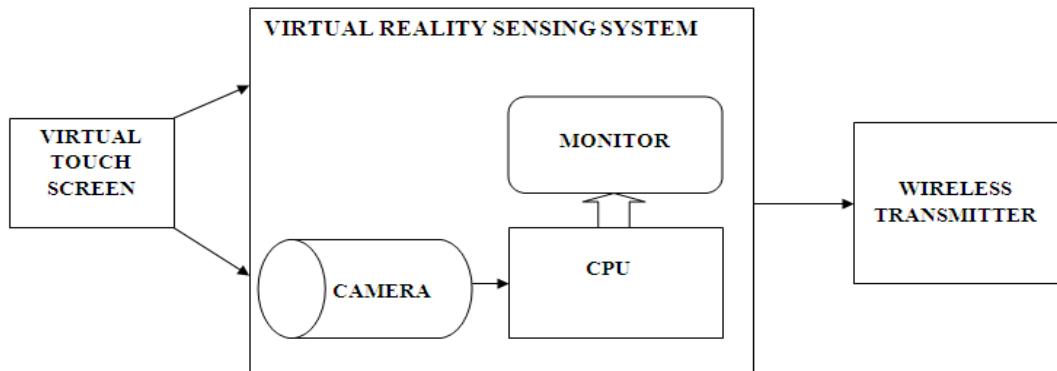
Fig 1: Transmitter
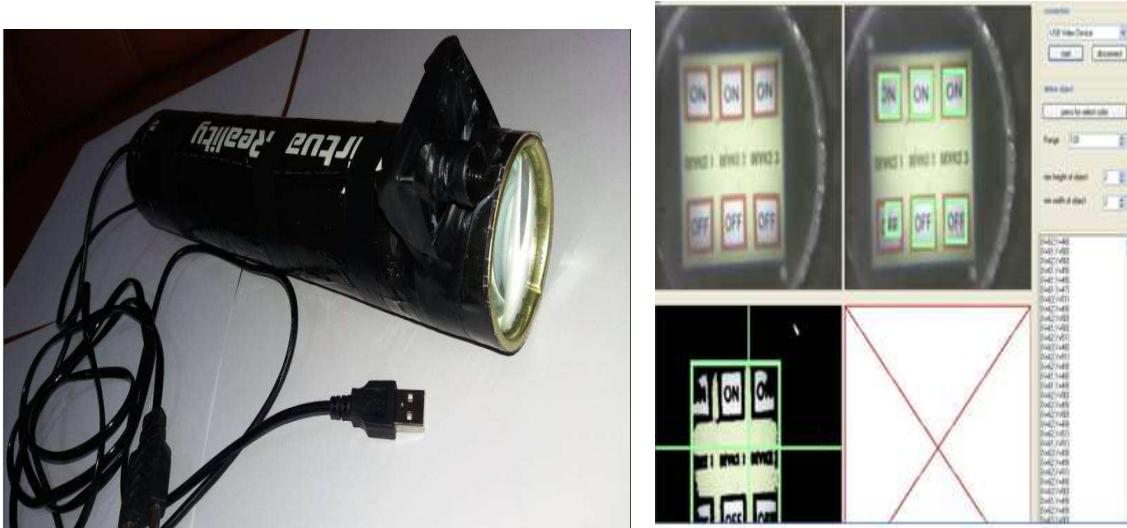
2.2   RECEIVER MODULE
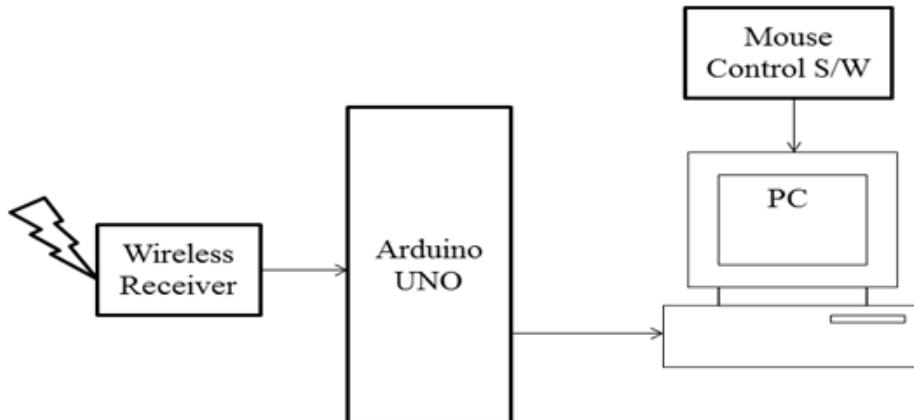
Fig 2: Receiver

2.3   VIRTUAL REALITY SYSTEM

Virtual Reality board designed to meet new forms of human-machine interaction (HMI). The advantage that enable the embedded system designer to easily, quickly and seamlessly add with the microcontroller by UART to their applications.

Virtual Reality board can easily interface with PC or Laptop by the USB driver provided. By running the setup application, you can adjust the distance by viewing the camera image available in the PC or Laptop in which the optimize interaction can done.

2.4   ZIGBEE MODULE

The Wireless transmitter and receiver using here is ZigBee modules. ZigBee devices are required to conform to the IEEE 802.15.4-2003 Low- Rate Wireless Personal Area Network standard. Its low power consumption limits transmission distances to 10–100 meters line-of- sight, depending on power output and environmental characteristics.

ZigBee devices can transmit data over long distances by passing data through a mesh network of intermediate devices to reach more distant ones. ZigBee is typically used in low data rate applications that require long battery life and secure networking. ZigBee has a defined rate of 250kbit/s, best suited for intermittent data transmissions from a sensor or input device.

3   RESULT AND DISCUSSION
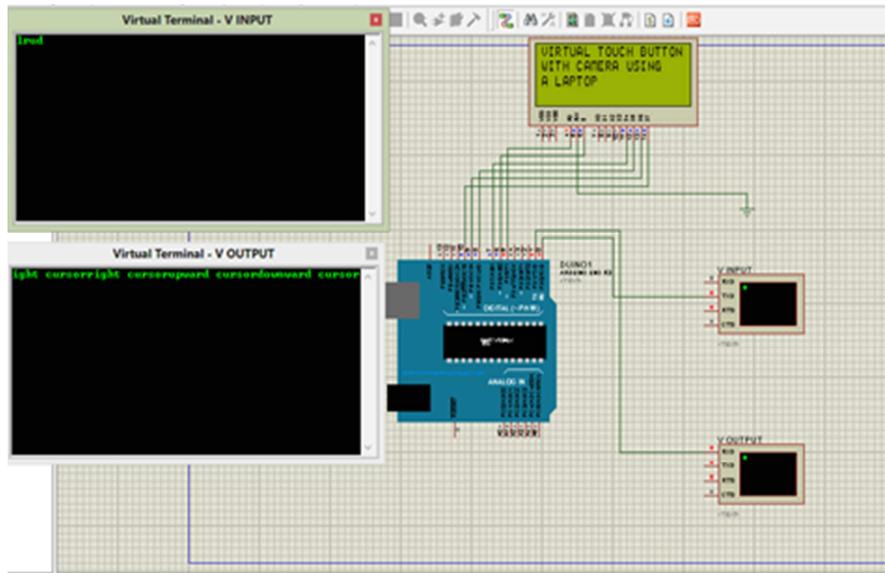
Fig 4: Proteus simulation

The output of the virtual touch buttons can be viewed in the proteus software. While pressing the key, the output can be viewed in the virtual terminal and also displayed in the LCD display.

When we press the button keys the display will shows the direction of the mouse control where we interact with the computer.

The Embedded C code is used for moment of the mouse keys. Simultaneously the other mouse moment can be viewed in this software.

Further work will be hardware implementation of Virtual touch buttons by the usage of Virtual reality system and the zigbee module. This allows the user's to interact with the Laptops/PC virtually.

4   CONCLUSION

We proposed a large interactive display named VIRTOS, with virtual touch buttons and touch sliders, which consist of a projector, a pale-colored wall, a computer, and one commodity camera as a highly practical and useful projector-camera system. In VIRTOS, a button touch is detected from the area of the shadow of the user's hand. The shadow area is segmented from the foreground (non-Projected) image by a momentary change of the button.

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